SONY

3-754-915-21(2)

Stereo Cassette Deck

Operating Instructions

TC-WR99ES

© 1992 by Sony Corporation

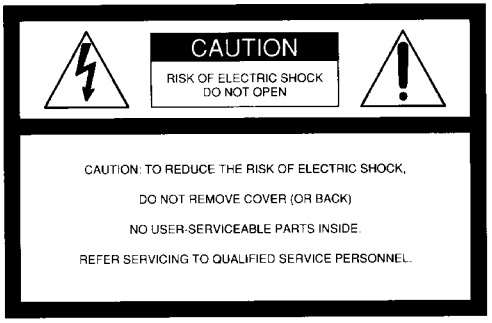
WARNING

Owner's Record

The model and serial numbers are located at the rear. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. TC-WR99ES Serial No. _____

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

* The graphical symbols are on the rear enclosure.

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

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Features

For higher quality recording/playback
- **The Dolby HX PRO* system** which improves the linearity of the tape's high-range response during recording.
- **Independent B and C type Dolby NR* systems on each deck** which allow the free selection of Dolby systems on each deck during Simultaneous Recording, Relay Recording, or normal-speed dubbing.
- **Independent bias calibration on each deck** to achieve the optimum bias current setting for any type.

For your convenience
- **Quick reversing** at the end of a tape to minimize interruptions during playback and recording.
- **Automatic tape type detection** during playback and recording.
- **The Multi-AMS, Blank Skip and Memory Play functions** which provide easy access to a desired selection.
- **A relay function** for long recording and playback.
- **Auto Play function** which automatically starts playback after tape rewinding to start.
- **Fade-in and Fade-out functions** to start and end recordings with a professional touch.
- **Timer-activated playback and recording** through the use of an optional timer.
- **Synchronized dubbing** at normal or high speed.
- **Simultaneous Recording function** for the simultaneous recording of the same source to cassettes in both decks.
- **A dubbing level control** which allows the dubbing volume level to be varied during normal-speed dubbing.
- **A tape speed control** for varying the tape speed (on deck A) during playback and normal-speed dubbing.

For easier operation
- **Automatic recording level adjustment** for one-touch protection against distortion.
- **Twin easy-to read digital linear counters** which show the elapsed recording or playing time on each deck.

* Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.
"DOLBY", the double-D symbol ⧈ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Precautions

On safety

- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it will not be used for a long time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.
- The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself has been turned off.

On operation

- When the unit is not used, turn the power off to conserve energy and to extend the useful life of your unit.
- Because of a safety mechanism, the function buttons will not operate if the cassette holder is not completely closed, if there is no cassette in the cassette holder, or if a cassette has been incorrectly inserted into the cassette holder.

On head cleaning

The head and tape path should be cleaned after every ten hours of operation. Dirty heads and a dirty tape path may cause:

— loss of high-frequency response
— loss of sound volume
— sound drop-out

If you have any questions or problems concerning your unit, please contact your nearest Sony dealer.

For the customers in the U. S. A.

For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS".

Unpacking

Checking the Supplied Accessories

Make sure that the following supplied accessories are included with your unit.

- Audio connecting cords (2)
- Screws M3 (4)

Notes on Installation

- Place the unit with the front panel facing you in a location with adequate air circulation to prevent overheating of the unit.
- Do not place the unit:
  — near heat sources such as radiators or air ducts.
  — in places subject to direct sunlight, excessive dust, mechanical vibration or shock.
  — in an inclined position.
  — on a rug or other soft surfaces that would block the ventilation holes on the bottom of the unit.

Do not throw away the carton and the packing material

They will come in handy when transporting the unit or shipping it for servicing.

Checking the Operating Voltage

- Operate the unit only on 120 V AC, 60 Hz.
- Before operating the unit, be sure that the operating voltage of your unit is identical with that of your local power supply.

Detaching the Side Panels

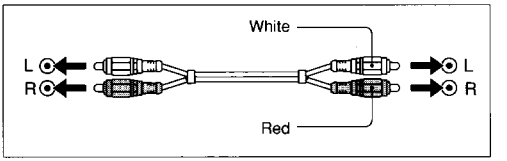
For the model with side panels which are detachable

After removing the screws, secure the cabinet with the supplied lock screws (M3 × 4). Do not use the longer screws. For safety, before doing this, be sure to disconnect the AC power cord from the AC outlet.

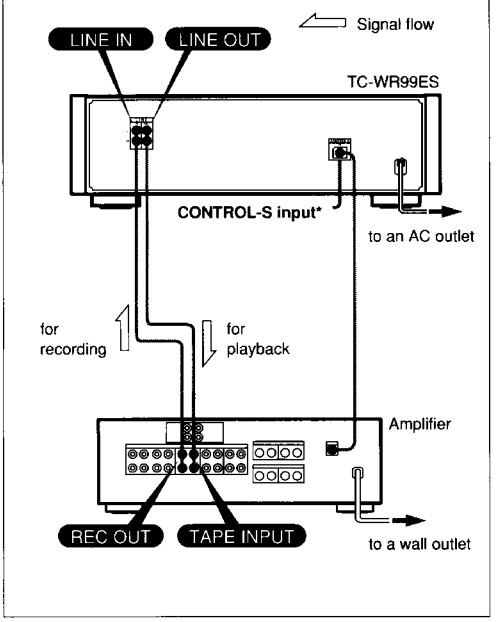
Hooking Up the System

Before You Begin

- Turn off the power to all equipment to be connected before making any connection.
- Note that the red plug of the supplied connecting cord is for right-channel (R) connection and the white plug for left-channel (L) connection.
- The connecting cords should be fully inserted into the jacks. A loose connection may cause hum pickup.



Hook-up Example

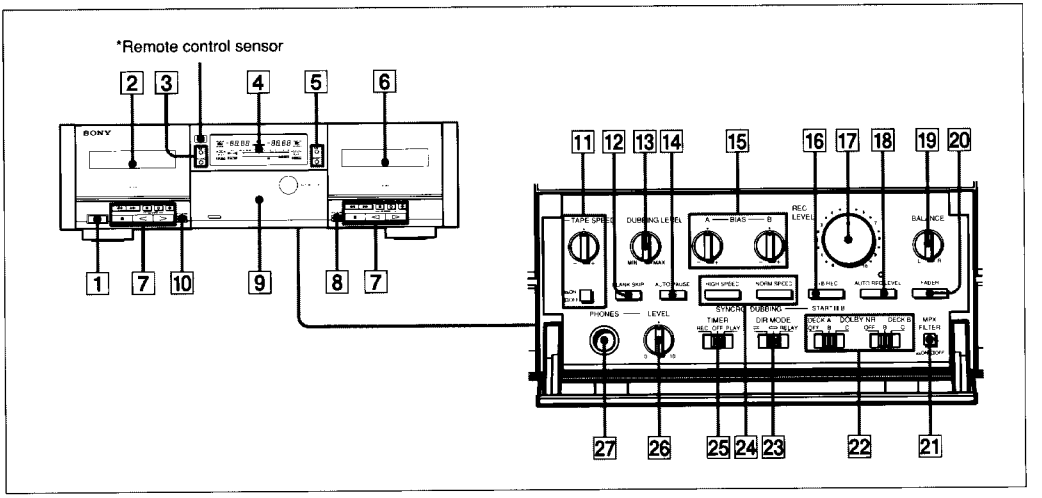


Note on the CONTROL-S input

To remotely control this unit through a receiver or an amplifier, connect the input on this unit to the CONTROL-S output on a Sony receiver or amplifier, with a CONTROL-S cable. When this connection is used, only remote commands sent through the receiver or amplifier will be executed. The remote sensor on this unit will not function.

Identifying the Parts

Front Panel



For details, refer to the page number indicated in parenthesis.

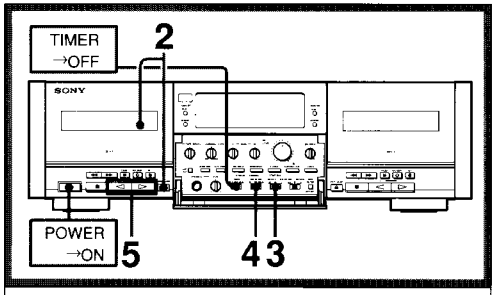
1 **POWER switch**
2 **Deck A**
3 **COUNTER buttons (deck A) (page 11)**
RESET button
MEMORY button
4 **Display panel**
5 **COUNTER buttons (deck B) (page 11)**
RESET button
MEMORY button
6 **Deck B**
7 **Tape operation buttons**
■ (stop) button
◄ (reverse play) button
► (forward play) button
◄◄ (leftward fast winding) (Multi-AMS) button**
►► (rightward fast winding) (Multi-AMS) button**
II PAUSE button
O REC MUTE (record muting) button (page 18)
● REC (recording) button
8 **≜ OPEN/CLOSE button (deck B)**
9 **Front cover**
10 **≜ OPEN/CLOSE button (deck A)**
11 **TAPE SPEED control and button (page 11)**
12 **BLANK SKIP button (page 9)**
13 **DUBBING LEVEL control (page 20)**
14 **AUTO PAUSE button (page 21)**
15 **BIAS controls (page 14)**
16 **A+B REC (simultaneous recording) button (page 16)**
17 **REC (recording) LEVEL control (pages 12 and 14)**
18 **AUTO REC (automatic recording) LEVEL button and indicator (page 12)**
19 **BALANCE control (page 12)**
20 **FADER button (pages 18 and 19)**
21 **MPX FILTER switch (page 14)**
22 **DOLBY NR (Dolby noise reduction) switches (pages 7, 8, 12, 16, 17 and 20)**
23 **DIR (direction) MODE switch (pages 7, 8, 12, 16, 17 and 20)**
24 **SYNCHRO DUBBING buttons (page 20)**
HIGH SPEED button
NORM (normal) SPEED button
25 **TIMER switch (page 23)**
26 **Headphone LEVEL control (page 7)**
27 **PHONES (headphones) jack (stereo phone jack) (page 7)**

***Remote control sensor**
You can remotely control this cassette deck with:
— A remote commander that came with a Sony amplifier or receiver if it has the **RM** mark and cassette deck control capability.
— Any optional Sony remote commander with the **RM** mark and cassette deck control capability.

**AMS is an abbreviation for Automatic Music Sensor.

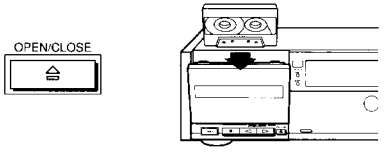
Playing Back

Follow the procedure below to play back a cassette on deck A or B.



1 **Turn on the amplifier and select the tape function.**

2 **Insert a cassette.**



3 **Set the respective DOLBY NR to the same position that was used when the cassette was recorded.**

4 **Set DIR MODE.**

To play back to the end of one side only	
To play back both sides continuously*	

* After playing back five times, the deck automatically stops.

5 **Press ◄ or ► to start playback.**

To play back **from the front side**, press ► .

To play back **from the reverse side**, press ◄ .

The tape direction lights up to show the side you are listening.

To stop playback, press the ■ button.
To stop playback momentarily, press the ❚❚ button.
To restart play, press the ❚❚ , ◄ or ► button.
To fastwind a tape rightward, press the ►► button in stop mode.
To fastwind a tape leftward, press the ◄◄ button in stop mode.

Set the TIMER switch to OFF
Otherwise, playback will start automatically when the power is turned on.

Is it necessary to set the tape type being used?
No. The deck has an automatic tape type detection system.

Starting operations while the cassette holder is open
Operations may be started while the cassette holder is open. For example, when the ◄ or ► button is pressed while the cassette holder is open, the cassette holder will close and playback will start.

To change to recording mode during playback
Keeping the ◄ or ► button pressed, press the ● button. The unit immediately switches from playback to recording without stopping the tape. This is useful when editing previously recorded material.

When decks A and B are in playback mode
Only playback from deck A will be audible.

If fast winding starts in the middle of a selection
The Blank Skip function (see page 9) is activated (the BLANK SKIP indicator is on). Press the BLANK SKIP button to deactivate the function.

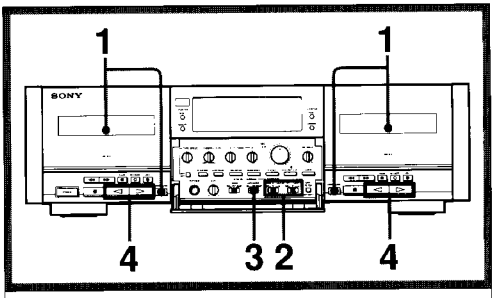
For headphone listening
Connect the headphone plug to the PHONES jack. Listening level can be controlled with the LEVEL control.

What is the Dolby NR system?
The Dolby NR (noise reduction) system reduces tape hiss noise in low-level, high-frequency signals by boosting the signals during recording and lowering them during playback.

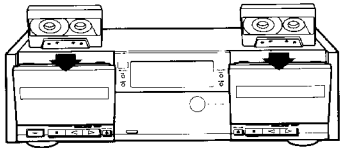
Note
The Dolby HX PRO system is effective only during recording, not during playback.

Playing Back Both Decks in Succession — Relay Play

The Relay Play function plays back cassettes in deck A and deck B continuously and in consecutive order.



1 **Insert cassettes into both decks.**



2 **Set DOLBY NR on both decks.**

3 **Set DIR MODE to RELAY.**

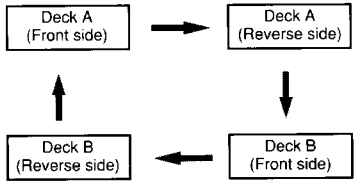
4 **Press ◄ or ► to start playback of the cassette to be listened to first.**

To play back **from the front side**, press ►.

To play back **from the reverse side**, press ◄.

To stop Relay Play
Press the ■ button of the deck playing.

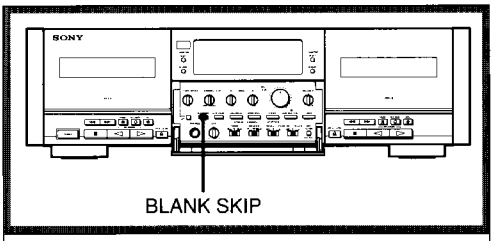
Playback sequence of Relay Play
Relay Play always follows the sequence below regardless of where playback starts.
After playing back five times, Relay Play automatically stops.



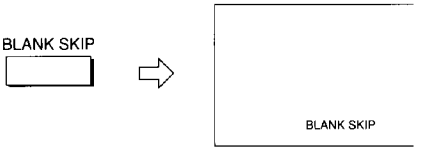
Playing back more than two cassettes in succession
Replacing cassettes that have finished playing with new ones allows you to play back two or more cassettes alternately on each deck.

Skipping Blanks — Blank Skip

The Blank Skip function fast winds the cassette when a blank space of ten seconds or more is encountered, then resumes playback when a recorded portion is detected.



Press BLANK SKIP to turn on the indicator.



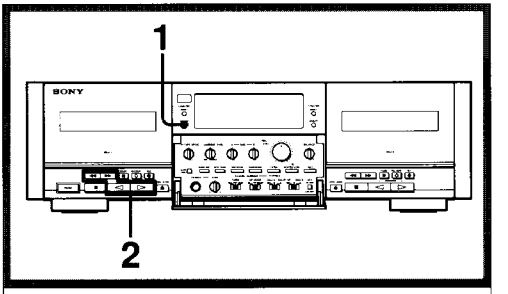
To deactivate the Blank Skip function
Press the BLANK SKIP button, turning off the BLANK SKIP indicator.

If the Blank Skip function activates within a selection
The selection contains intervals of silence or low volume.

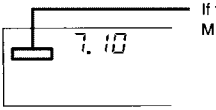
If the PLAY indicator begins to flash during playback
This indicates that the Blank Skip function is operating.

Playing Back Automatically After Rewinding — Auto Play

The Auto Play function automatically starts playing back a cassette after fast winding it to the beginning.

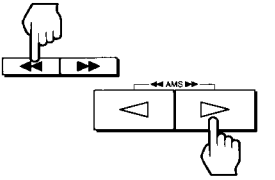


1 **Make sure the MEMORY indicator of the deck to be used is off.**



If the indicator is on, press MEMORY.

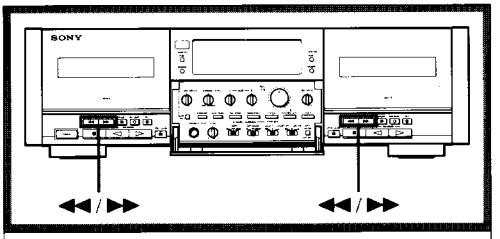
2 **While pressing ► or ◄, press ◄◄ or ►►.**



From the beginning of...	While pressing...
front side	►, press ◄◄.
reverse side	◄, press ►►.

Locating a Selection — Multi-AMS(Automatic Music Sensor)

By detecting the blank space between selections, the Multi-AMS function allows you to skip up to 30 selections during fast forwarding or reversing to locate the beginning of a selection.

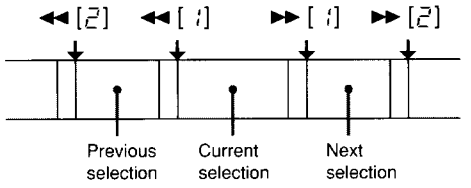


During playback, press ◀◀ or ▶▶ as many times as the number of selections to be skipped.

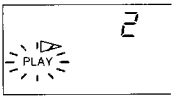
Playback direction indicator	To locate a selection after the current one	To locate a selection before the current one*
▷	▶▶	◀◀
◁	◀◀	▶▶

* Pressing ◀◀ or ▶▶ once locates the beginning of the current selection.

Tape direction indicator: ▷
↓ : Beginning of selection



- The number of selections to be skipped, which replaces the counter indication, decreases by one each time a blank space is detected.
- The PLAY indicator flashes during Multi-AMS operation.
- When the beginning of the desired selection is reached, the counter indication returns and playback automatically restarts.



Modifying the indicated number of selections to be skipped
The number of selections to be skipped may be modified by pressing the ◀◀ or ▶▶ button at any time, even during Multi-AMS operation.

Regarding changes in the indicated number
The indicated number of selections to be skipped may change even as it is being set due to the detection of blank spaces during fastwinding of the unit.

The Multi-AMS may skip a selection in the following cases:
- If the ▶▶ (or ◀◀) button is pressed immediately before the following selection.
- If there is noise in the space between selections.
- If the space is less than four seconds long.

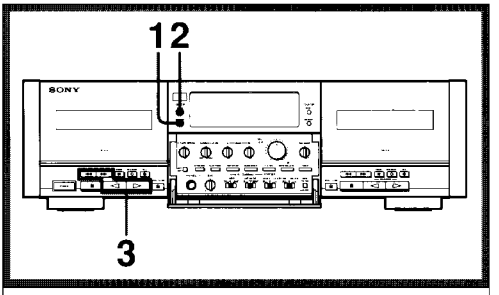
The Multi-AMS will treat the following as blanks:
- a long pause in the music
- a passage of low frequencies or very low volume
- a gradual increase or decrease in volume

The Multi-AMS does not function on both decks simultaneously
- The Multi-AMS is activated for the deck whose ◀◀ or ▶▶ button is pressed first.
- If the Multi-AMS is activated for deck B during playback on deck A, deck B fast winds to the beginning of the selection and stops.
- If the Multi-AMS is activated for deck A during playback on deck B, deck A fast winds to the beginning of the selection and begins playback. The sound from deck B will be cut off when playback begins on deck A.

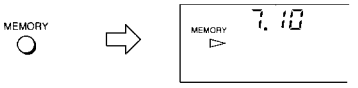
Note:
Even if the DIR MODE switch is set to ⇦ , the Multi-AMS function does not extend to the other side, but stops when the first side comes to an end.

Locating a Desired Position Using the Counter — Memory Play

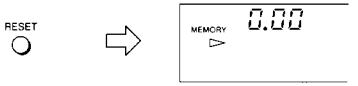
The Memory Play function allows you to use the counter to record a desired position on a cassette for fast relocation and automatic playback later.



1 **Press MEMORY to activate the Memory Play function of the deck to be used.**



2 **Press RESET to reset the counter at the desired position.**
The desired position is memorized.



3 **To return to the desired position.**
Check the direction indicator and press the respective buttons shown below.

Direction Indicator	While pressing...
▷ PLAY	►, press ◄◄.
◁ PLAY	◄, press ►►.

Returning to the memorized position in stop mode — Memory stop
If you press only the ◄◄ or ►► button when the MEMORY indicator is on in the stop mode, the tape rewinds and the unit stops when the counter reaches 0.00.
Be sure to first stop playback before activating the Memory Stop function, otherwise the AMS function will activate.

To deactivate the Memory Play function
Press the MEMORY button, turning off the MEMORY indicator.

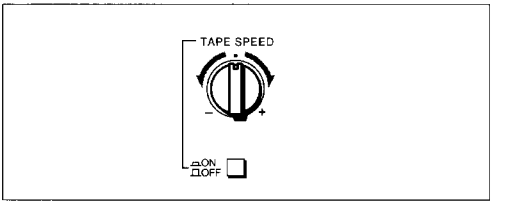
Note on Memory Play/Stop
In actuality, the tape is rewound to slightly short of 0.00.

Do not turn off the power while using the counter
Turning the power off, then on again resets both counters to 0.00.

Making Fine Adjustments to the Tape Speed

The TAPE SPEED control can be used to vary the tape speed during tape playback on deck A or normal-speed dubbing from deck A to B.

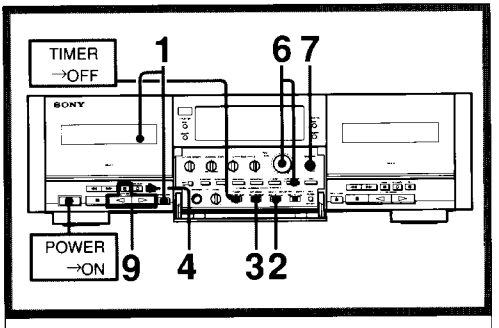
- With the TAPE SPEED button depressed (in the "on" position), turning the TAPE SPEED control towards "–" lowers the tape speed by up to about 10%, and turning it towards "+" raises the tape speed by up to about 10%. The normal tape speed is indicated by the center position.
- Please note that varying the tape speed alters the frequency characteristics of the sound, cancelling the effects of the DOLBY NR function.
- The tape speed cannot be varied during recording or high-speed dubbing. Keep the TAPE SPEED button in the "off" position when not using the tape speed control function.



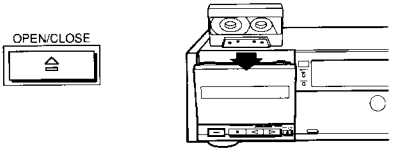
Recording

How to Record to a Cassette

Follow this procedure to record a source on a cassette in deck A or deck B.



1 Insert a cassette.



2 Select respective DOLBY NR.

3 Set DIR MODE.

To record on one side	
To record on both sides	

Note

Even at the ⇦ position, recording automatically stops when the tape reaches the end of the reverse side.

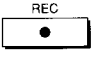
4 Press ● of the deck to be used to enter the recording pause mode.

Note

The direction indicator for the side opposite the specified one will flash for three seconds to indicate that recording is possible on that side also. If, however, the tab for that side has been removed to prevent recording, the indicator will not flash.

If the tab has been removed from either side A or B, recording is impossible on the side(s).

To record a cassette for recording, cover the respective slot with tape. See "To Protect a Recording" on page 15.

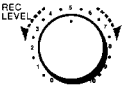


5 Play the program source to be recorded.

6 Press AUTO REC LEVEL to activate the Automatic Recording Level function.

For manual adjustment, see page 14.

- The REC LEVEL control automatically rotates to the proper recording level.
- The AUTO REC LEVEL indicator stops flashing when the level is set.



7 Turn BALANCE to adjust the balance.

8 Restart the program source, if required.

9 **Press ❚❚, ◄◄ or ►► to start recording.**

To record on the front side of the cassette	
When ▷ is on	Press ►► once or ❚❚.
When ◁ is on	Press ►► twice.

To record on the reverse side of the cassette	
When ◁ is on	Press ◄◄ once or ❚❚.
When ▷ is on	Press ◄◄ twice.

Note
Pressing the ◄◄ or ►► button twice will cause the unit first to change tape direction and then start recording in that direction.

To stop recording
Press the ■ button.

To deactivate the Automatic Recording Level function
Press the AUTO REC LEVEL button (or turn the REC LEVEL control manually).

Set the TIMER switch to OFF
Otherwise, recording will start automatically when the power is turned on.

Checking the recording time on a tape
To check the remaining recording time on a tape:
1 Press the RESET button to reset the counter to 0.00.
2 Press ◄◄ or ►► to advance the tape to its end. The number on the counter shows the approximate recording time.

To check the total recording time of a tape, first rewind the tape to its beginning, then follow the same steps as above. (See "The Accuracy of the Linear Counter".)

The Accuracy of the Linear Counter

Since the counter is not a digital clock, the number will differ from the actual elapsed playback or recording time by a few minutes, depending on such factors as tape length and hub size.
When decks A and B are operated at the same time, slight differences in tape length (even in the case of identical tape types) and running speeds will result in a difference of a few minutes between both counters.

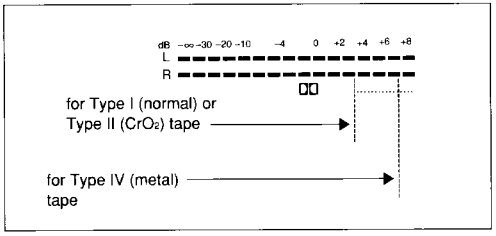
Adjusting the Recording Level Manually

The Automatic Recording Level function may not be able to set the proper recording level in the following cases:

- When the source input contains noise, such as that caused by dust on a record, a record needle, or noise from a radio reception.
- During passages of low-volume sound, such as pianissimos in classical music. If later passages contain high-volume sound, the Automatic Recording Level function should be used to set the recording level for those passages.
- When proper adjustment is not possible due to the high-volume sound produced through the graphic equalizer.

In these cases, manual recording level adjustment is recommended.

To adjust the recording level manually
Adjust the REC LEVEL control as high as possible making sure that the PEAK LEVEL METER reading does not exceed the recommended range for the tape type being used. (See diagram.)



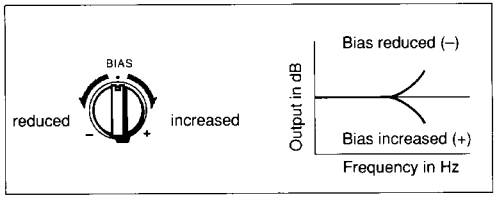
Tips on recording level adjustment
- If the recording level setting is too high, the recording will be distorted; if it is too low, the tape will produce a hissing sound. Therefore, the recording level should be set as high as possible without causing distortion.
- If the program source to be recorded has many high frequency signals, set the level to a relatively low position.

Recording FM Broadcasts with the Dolby NR System

When recording FM broadcasts with DOLBY NR system, set the MPX FILTER switch to ON.
The MPX filter eliminates remnants of the 19 kHz stereo carrier and 38 kHz subcarrier signals which may impair the operation of the DOLBY NR system. Be sure that the Dolby NR switch is turned on since the MPX filter will not function otherwise. During recording with the Dolby NR system, use this switch only if the tuner is not equipped with its own MPX filter or the equipped filter does not function effectively.

Adjusting the Bias According to the Tape Type

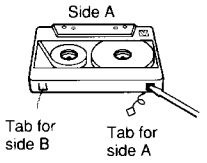
To obtain the optimum frequency response, use the BIAS control to adjust the bias current according to the tape type being used. Reducing the bias boosts high frequencies but increases distortion. Increasing the bias decreases distortion but suppresses high frequencies. Balance the bias according to your listening preference.



Note
In the case of Type IV cassette tapes, the frequency change for any given bias setting will be minimal.

To Protect a Recording

To protect a recording on side A or B
Break out the respective tab.



To recover a cassette for recording
Cover the respective slot with tape.

When using Type II (CrO_2) or Type IV (metal) cassettes
Be careful not to cover the detector slots which are necessary for automatic tape type detection.

Type II (CrO_2) cassette and its detector slots

Type IV (metal) cassette and its detector slots

Cassette Care

- Avoid touching the tape surface of a cassette to prevent contamination of the heads by dirt, dust, or oil on the skin.
- Keep cassettes away from equipment with magnets, such as speakers and amplifiers, as erasure or distortion of the recorded tape could occur.
- Do not expose cassettes to direct sunlight, extremely cold temperatures, or moisture.

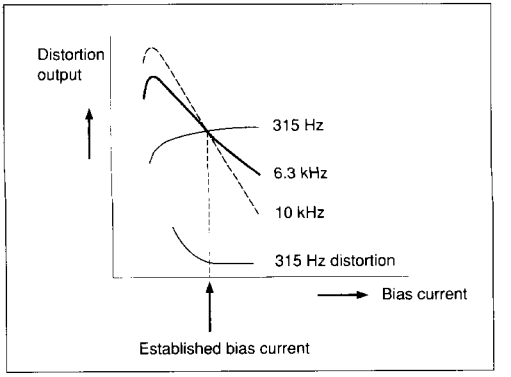
Note on cassettes longer than 90 minutes

The use of cassettes longer than 90 minutes is not recommended except for long continuous playback.

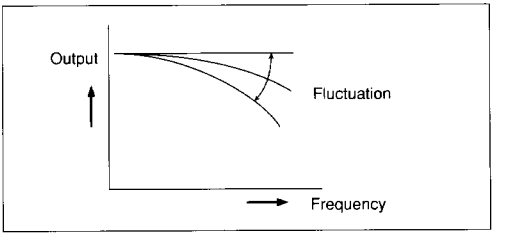
What is the Dolby HX PRO system?

The Dolby HX PRO system provides linearity in high-range frequency response during recording. Tapes recorded with this system retain the same high quality even when played back on other tape decks.

As shown below, characteristics such as output level and distortion differ widely according to the bias (high-frequency) current.



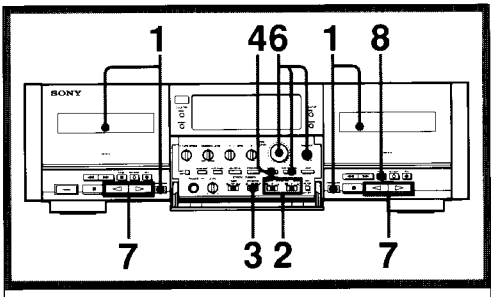
In conventional systems (see diagram below), the bias current is susceptible to variations in certain recording signals which may cause fluctuations in frequency response, distortion, or other unwanted characteristics.



With the Dolby HX PRO system, the effective bias amount added to the bias current is controlled in millisecond units to greatly reduce distortion, improving linearity in high-range response and ensuring high-intensity recording with minimal distortion and noise.

Recording the Same Source on Both Decks — Simultaneous Recording

The Simultaneous Recording function allows you to record the same source on cassettes in decks A and B at the same time.



1 **Insert cassettes for recording into both decks.**

2 **Set DOLBY NR on both decks.**

3 **Set DIR MODE.**

To record on one side	
To record on both sides	

4 **Press A + B REC to place both decks into recording pause mode.**

5 **Play the program source to be recorded.**

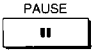
6 **Adjust the recording level and balance. (See pages 12 and 14)**

7 **Select the side from which to start recording.**

To start recording **from the front side,** press ►.

To start recording **from the reverse side,** press ◄.

8 **Press II of the deck B to start recording.**



To stop Simultaneous Recording
Press the ■ button on the respective decks.

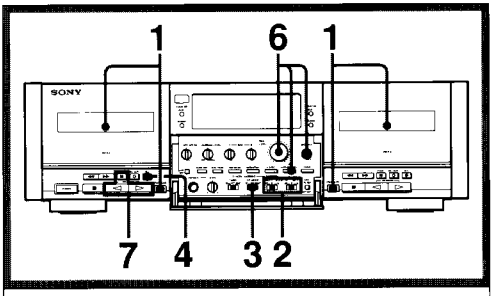
If the A + B REC indicator flashes three times
A tab is missing for one of the sides selected for recording. Cover the slot with tape (see page 15).

Using the II and O buttons during Simultaneous Recording
Pressing the II or O button on deck B during Simultaneous Recording activates the respective function on both decks at the same time. The II and O buttons on deck A are disabled during Simultaneous Recording.

Fade-in and fade-out during Simultaneous Recording
Pressing the FADER button after step 7 of the procedure for Simultaneous Recording will cause fade-in recording on both tapes.
Pressing the FADER button during Simultaneous Recording will cause fade-out recording on both tapes (For an explanation of the Fade-in and Fade-out function, see pages 18 and 19).

Recording on Both Decks in Succession — Relay Recording

The Relay Recording function can be used to make a continuous recording that starts on a cassette in deck A and ends on a cassette in deck B.



1 **Insert cassettes for recording into both decks.**

2 **Set DOLBY NR on both decks.**

3 **Set the direction mode to RELAY.**

4 **Press ● to place deck A into recording pause mode.**

5 **Play the program source to be recorded.**

6 **Adjust the recording level and balance.** **(See pages 12 and 14)**

7 **Press II, ◄ or ► on deck A to start recording.**

To record on the front side of the cassette	
When ▷ is on	Press ► once or II.
When ◁ is on	Press ► twice.

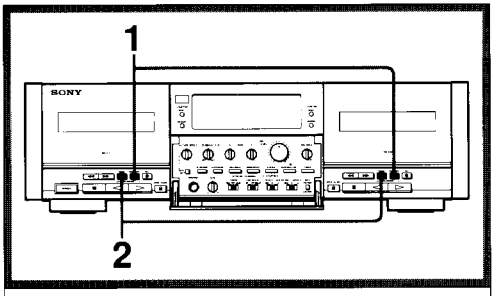
To record on the reverse side of the cassette	
When ◁ is on	Press ◄ once or II.
When ▷ is on	Press ◄ twice.

To stop Relay Recording
Press the ■ button on the deck which is recording.

Relay Recording on reverse side of the cassette in deck A has finished
Recording continues on deck B in the direction of the current tape direction indicator. When ◁ is on, Relay Recording stops when the reverse side comes to an end.

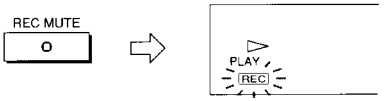
Inserting a Blank Space during Recording — Record Muting

The Record Muting function allows you to insert a four-second blank to enable proper Multi-AMS operation (see page 10), and to replace unwanted input with a blank of any desired length.

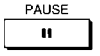


1 While recording, press O and release it immediately.

The REC indicator starts to flash. During this time, no incoming signals are recorded on the tape.
After four seconds, the II indicator lights up and the unit enters recording pause mode.



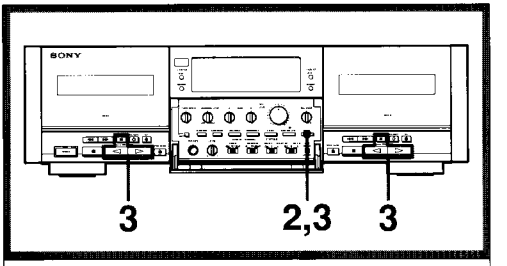
2 Press II to resume recording.



To create a blank longer than four seconds
Press the O button for the desired length of time. After four seconds, the REC indicator flashes with greater rapidity. When you release the O button, the II indicator lights up and the unit goes into recording pause mode.
Press the II button to resume recording.

Starting a Recording with Fade-in

The Fade-in function starts a recording with a gradual increase in the recorded signal.



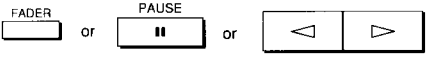
1 Perform steps 1 through 7 on page 12 to prepare for recording.

2 Press FADER.

The FADE inidcator flashes and the REC LEVEL control rotates counterclockwise.

3 Press FADER, II, ◄ or ► to start recording.

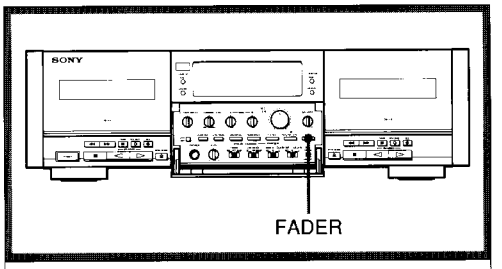
The FADE indicator flashes and the REC LEVEL control rotates clockwise to produce a fade-in effect on the tape.



To stop recording
Press the ■ button.

Ending a Recording with Fade-out

The Fade-out function ends a recording with a gradual decrease in the recorded signal.



Press FADER to activate the Fade-out function at the end of a recording.

The FADE indicator turns on and the REC LEVEL control rotates to zero to create a fade-out effect on the tape. After the REC LEVEL control reaches zero, the FADE indicator turns off, the REC LEVEL control returns to its original position, and a four-second blank is created on the tape.

After ending a recording with Fade-out
The deck changes to recording pause mode.
Press the ■ button to deactivate the recording function.

Notes on Fade-in/Fade-out

If a deck is already in recording mode
The FADER button cannot be used for recording on the other deck. If the FADER button is pressed at this time, the Fade-out function is activated for the deck in recording mode and the recording is ended.

If the REC LEVEL control is preset to zero
There will be no fade-in or fade-out effect recorded on the tape.

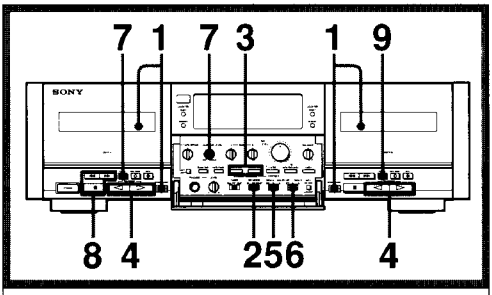
If the REC LEVEL control is preset to ten
The REC LEVEL control may not return exactly to its original position after fade-in or fade-out recording is completed. However, the recording level will be equivalent to the original setting of ten.

Using the Fade-in and Fade-out functions during Simultaneous Recording
To use the Fade-in function, press the FADER button after step 7 on page 16, then press the ❚❚ or FADER button to start Simultaneous Recording.

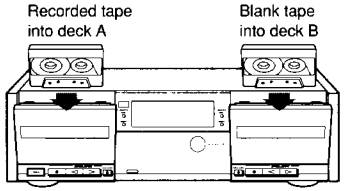
To use the Fade-out function, press the FADER button at the end of Simultaneous Recording. (see page 16.)

Dubbing a Tape

Use the dubbing function to copy a tape in deck A to a tape in deck B. High speed dubbing is convenient for dubbing entire tapes while normal-speed dubbing is handy for tape editing.



1 **Insert cassettes into both tape decks.**



2 **Select the direction mode.**

One side		
Both sides		Dubbing of the reverse side starts independently of deck A.
		Dubbing of the reverse side starts simultaneously with deck A.

3 **Press HIGH SPEED or NORM SPEED to select the dubbing speed.**

4 **Select the side on which to start dubbing.**

To dub **from the front side**, press ►.

To dub **from the reverse side**, press ◄.

5 **Set DOLBY NR on deck A.**

For normal-speed dubbing: Go to step 6.

For high-speed dubbing: Go to step 9.

6 **Set DOLBY NR on deck B.**

7 **Press II on deck A to start playback on deck A and adjust the dubbing level by turning the DUBBING LEVEL Control.**

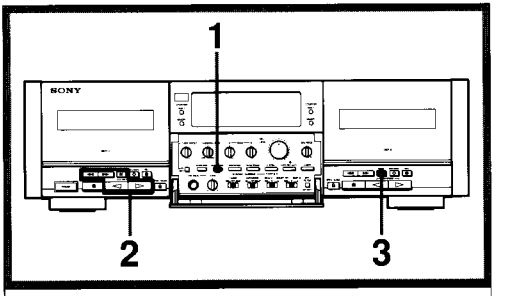
See "Adjusting the Recording Level Manually" on page 14.

8 **Press ■ on deck A to stop playback on deck A and rewind the cassette by pressing the ◄◄ or ►► button.**

9 **Press II on deck B to start dubbing.**

Dubbing Only Desired Selections

Follow this procedure to dub from the beginning of desired selections. Note that this is possible only in the normal-speed dubbing mode.



1 **Press AUTO PAUSE before or during normal-speed dubbing.**

Each time one playback selection on deck A ends, deck A goes into the pause mode and deck B goes into the recording pause mode.

AUTO PAUSE

2 **Locate the desired selection on deck A (page 10).**

PAUSE

or

3 **Press II on deck B to resume dubbing.**

PAUSE

To deactivate the Auto Pause function
Press the AUTO PAUSE button again.

The Auto Pause function will not operate
If the space between selections is too short or contains noise.

To stop dubbing
During normal-speed dubbing, press the ■ button on deck B. During high-speed dubbing, press the ■ button on either deck A or B.

Changing the tape speed during playback (during normal-speed dubbing only)
The TAPE SPEED control can be used to make fine adjustments to the tape speed on deck A during normal-speed dubbing (see page 11).

During high-speed dubbing
Only the ■ button is operative.

If the NORM or HIGH SPEED indicator flashes three times
Either one or both tabs of the cassette inserted into deck B have been removed, making dubbing impossible for that side. Cover the slot(s) with tape (see page 15).

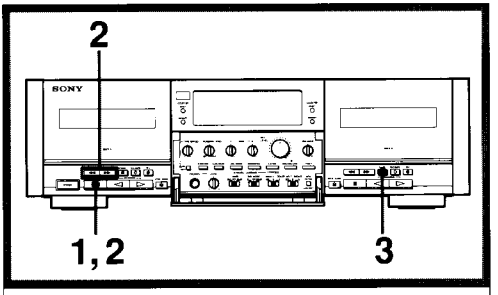
Is it necessary to select the Dolby NR system on deck B and set the dubbing level during high-speed dubbing?
No, since the Dolby NR system and recording level of deck A are automatically used to record the tape in deck B.

Using the Blank Skip function during tape dubbing
Pressing the BLANK SKIP button will activate the Blank Skip function and turn on the BLANK SKIP indicator. When a blank of ten seconds or more is encountered, dubbing will stop while the unit fast winds to the next recorded portion. When one is found, dubbing resumes.

Notes on tape dubbing
- Do not change the dubbing speed setting during tape dubbing.
- If the sound is affected by the proximity of a television set during high-speed dubbing, turn the television set off or move it away from the deck.
- The DOLBY NR indicator on deck B does not light up during high-speed dubbing.

Dubbing Only Desired Portions

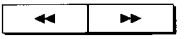
Follow this procedure to dub only desired portions of selections. Note that this is only possible in the normal-speed dubbing mode.



1 **Press ■ on deck A at the start of a selection to be skipped:**

Deck A enters the stop mode and deck B enters the recording pause mode.

2 **Locate the desired portion on deck A.**

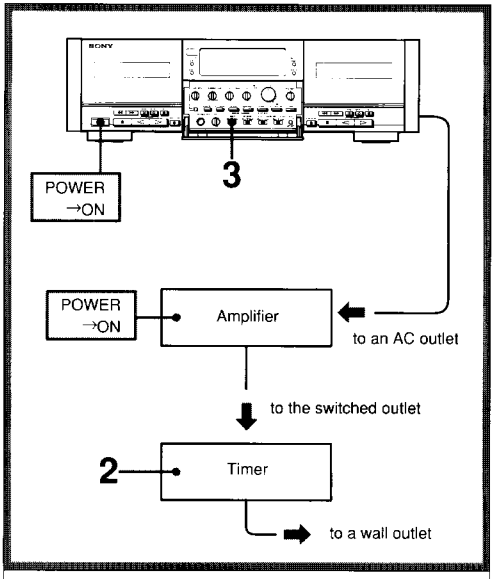


3 **Press II on deck B to resume dubbing.**

PAUSE

Timer-Activated Playback and Recording

By connecting a commercially available timer, automatic recording or playback can be performed at a preset time.



1 **Prepare the unit for playback or recording.**

To playback	For single-deck playback, follow steps 1 to 4 on page 7. For Relay Play, follow steps 1 and 3 on page 8.
To record	For single-deck recording, follow steps 1 to 7 on page 12. For Simultaneous Recording, follow steps 1 to 7 on page 16. For Relay Recording, follow steps 1 to 6 on page 17.

After completing the preparations, press ■ to change the unit to stop mode.
Make sure to close the holder completely.

2 **Set the timer to the desired time.**
Power to the unit will be cut off.

3 **Set TIMER to PLAY or REC.**
Playback or recording will start at the preset time.

Check the direction mode indicator
Timer-activated operations start from the side of the cassette being used when the power was turned off. However, for Relay Recording or Relay Play, recording or playback on deck B always starts from the front side.

For single-deck recording
Be sure that only one cassette is inserted into either deck A or deck B for single-deck recording. If a second cassette is inserted and the direction mode is set to ⇄ or ⇨, Simultaneous Recording will occur and both tapes will be erased.

Make sure the cassette holder is closed
If the cassette holder is left open, recording or playback will not activate at the desired time.

Keep the POWER switch on the unit on
When the timer is set, the power of the unit will be cut off. However, the POWER switch must be on to start the timer-activated operation.

Automatic recording level adjustment and fade-in during timer-activated recording
When the REC LEVEL control is set to zero, the Automatic Recording Level function is automatically activated at the start of timer-activated recording.
If the optimum recording level is set, then fade-in will automatically be activated when timer-activated recording begins.

When the timer-activated operation is completed
Set the TIMER switch on the unit to OFF. If the TIMER switch is left at REC, the unit will automatically start recording the next time the power is turned on, and the previously recorded material may be erased.

Maintenance

Cleaning the Heads and Tape Path

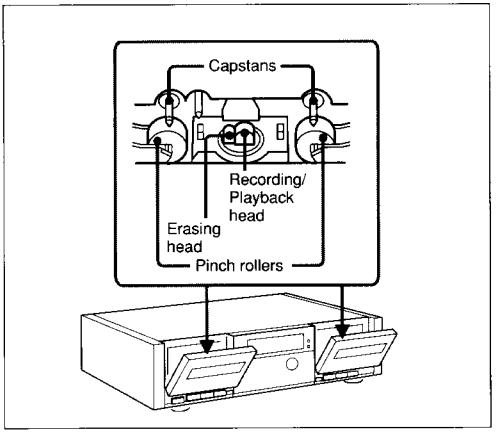
Clean all surfaces over which the tape travels after every ten hours of operation to guard against:
— low-quality sound
— a decrease in sound level
— excessive wow, flutter or drop-out
— incomplete erasure
— impairment of recording function

To obtain high-quality recorded sound, cleaning before every recording is recommended.

1 Keeping the power on, turn the volume control on the amplifier to minimum.

2 Press ≙ to open the cassette holder.

3 Wipe the heads, the pinch rollers and the capstans with a cotton swab slightly moistened with alcohol or commercially available cleaning fluid for tape decks.



Do not insert a cassette until the cleaned areas are completely dry.

Demagnetizing the Heads

After 20 to 30 hours of use, or when you notice hiss and/or loss of high frequencies, the residual magnetism built up on the heads should be removed.

1 Keeping the power on, turn the volume control on the amplifier to minimum.

2 Press ≙ to open the cassette holder.

3 Demagnetize the heads with any commercially available demagnetizer.

Refer to the instruction manual of the demagnetizer for detailed instructions.

Cleaning the Cabinet

Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution.
Do not use any type of abrasive pad, scouring powder or solvents such as alcohol or benzine.

Specifications

Recording system 4-track 2-channel stereo
Fast winding time Approx. 90 sec. (with Sony C-60 cassette)
Bias AC bias
Signal-to-noise ratio (at peak level)

Cassette (Dolby NR switch: OFF)	Type IV (Sony Metal-Select)	Type II (Sony UX-S)	Type I (Sony HF-S)
	59 dB	58 dB	56 dB

Measured at peak level weighted without NR. The S/N is improved by about 15 dB at 500 Hz and by about 20 dB about 1 kHz with Dolby-C NR on, and by 5 dB at 1 kHz and by 10 dB about 5 kHz with Dolby-B NR on.

Harmonic distortion
0.4% (with Sony Type I, 160 nWb/m, 315 Hz, 3rd H.D.)
1.8% (with Sony Type IV, 250 nWb/m, 315 Hz, 3rd H.D.)

Frequency response (DOLBY NR OFF)

Type IV cassette (Sony Metal-Select)	20 - 20,000 Hz (±3 dB,IEC) 30 - 15,000 Hz [±3 dB (-4dB) recording]
Type II cassette (Sony UX-S)	25 - 18,000 Hz (±3 dB,IEC)
Type I cassette (Sony HF-S)	25 - 16,000 Hz (±3 dB,IEC)

Wow and flutter ±0.09% W.Peak (IEC)
0.06% WRMS (NAB)
±0.16% W.Peak (DIN)

Inputs

Line inputs (phono jacks)	Sensitivity	0.16 V
	Input impedance	47 kilohms

Outputs

Line outputs (phono jacks)	Rated output level	0.5 V at a load impedance of 47 kilohms
	Load impedance	Over 10 kilohms
Headphones (stereo phone jack)	Output level	0 — 3 mW at a load impedance of 32 ohms

General

Power requirements 120 V AC, 60 Hz
Power consumption 30 W
Dimensions Approx. 470 × 135 × 350 mm (w/h/d)
($18^{5}/_{8} \times 5^{3}/_{8} \times 13^{7}/_{8}$ inches) including projecting parts and controls
Weight Approx. 7.5 kg (16 lbs 9 oz)

Supplied accessories

Audio connecting cords (2)
Screws (M3) (4)

Design and specifications are subject to change without notice.

Troubleshooting Guide

The following trouble checks will help you correct the most common problems encountered with your tape deck. Should any problems persist after you have made these checks, consult your nearest Sony dealer.

Before proceeding with these trouble checks, verify that:
- The power cord is firmly connected.
- Amplifier connections are firmly made.
- Heads, capstans and pinch rollers are clean.
- The amplifier controls and switches are set correctly.

Function Buttons and Tape Transport Problems

Symptom	Cause	Remedy
The function buttons do not activate.	The cassette is not properly inserted.	Insert cassette correctly.
	Button was pressed immediately after power was turned on.	Wait until the ▮▮ indicator stops flashing.
Playback or recording begins when the power is turned on.	The TIMER switch is not set to OFF.	Set the TIMER switch to OFF.
The ● button does not activate.	There is no cassette in the holder.	Insert a cassette.
	A tab has been removed from the cassette.	Cover the slot with tape (page 15).
Automatic shut-off mechanism activates before the tape comes to its end.	The tape is slack.	Take up the tape slack.
	The cassette shell is deformed.	Use another cassette.
	The Memory Play function is activated.	Press the MEMORY button to deactivate the function.
Excessively loud tape transport noise during fast winding.	This noise is caused by the cassette and does not signify a mechanical problem.	—
The cassette holder will not close.	There has been a power failure or the power cord has been disconnected while the cassette holder is open.	Reconnect the power.
The ⏏ button does not function.	There has been a power failure or the power cord has been disconnected.	Reconnect the power.

Recording and Playback Problems

Symptom	Cause	Remedy
Recording or playback cannot be made or there is a decrease in sound level.	The recording/playback and erasing heads are either dirty or magnetized.	Clean or demagnetize the heads.
	Improper connection.	Make connections properly (page 5).
	Improper setting of the amplifier controls.	Set the amplifier controls to the appropriate positions
Excessive wow, flutter or dropout.	The head, capstan or pinch roller is dirty.	Clean in accordance with instructions (page 24).
Incomplete erasure.	The erasing head is dirty.	Clean the erasing head.
Increased noise or poor reproduction in high frequencies.	The head is magnetized.	Demagnetize the head.
Unbalanced tone in high frequencies.	Improper setting of the DOLBY NR switch.	During playing back,set the switch to the same position used in recording.
	The unit is placed near a television set.	Move the deck away from the television set.
The desired selection cannot be located even if you activate the Multi-AMS.	There is noise in the space between selections.	Rerecord the tape if you can, and insert a blank space of four seconds using the O button.
	The space is less than four seconds long.	
	The ▶▶ (or ◀◀) button was pressed immediately before the beginning of the following selection.	—
Playback begins in the middle of a selection when the Multi-AMS or Blank Skip function is activated.	The selection contains one of the following: — a long pause in the music — a passage of low frequencies or very low volume — a gradual increase or decrease in volume	While the tape is playing, press the ◀◀ or ▶▶ button again.

Noise

Symptom	Cause	Remedy
Hum noise.	The unit is stacked on or under the amplifier.	Separate the unit.
Noise is recorded.	The recording was made near equipment such as a television set or a color monitor, and interference has affected the recording on the tape and the Dolby NR system.	Move the unit away from the television set or color monitor.